

Log of CS publications

2017

Tipping, E., Davies, J.A.C., Henrys, P.A., Kirk, G.J.D., Lilly, A., Dragostis, U., Carnell, E.J., Dore, A.J., Sutton, M.A., Tomlinson, S.J. (2017) Long-term increases in soil carbon due to ecosystem fertilization by atmospheric nitrogen deposition demonstrated by regional-scale modelling and observations. *Scientific Reports* 7, 1890. [doi:10.1038/s41598-017-02002-w]

Malik AA, Thomson BC, Whiteley AS, Bailey M, Griffiths RI. (2017) Bacterial physiological adaptations to contrasting edaphic conditions identified using landscape scale metagenomics. *mBio* 8:e00799-17. [https://doi.org/10.1128/mBio.00799-17]

Hill, L., Hector, A., Hemery, G., Smart, S., Tanadini, M. and Brown, N. (2017) Abundance distributions for tree species in Great Britain: A two-stage approach to modeling abundance using species distribution modeling and random forest. *Ecology and Evolution* 7, 1043–1056. [doi: 10.1002/ece3.2661]

Gillespie, M. A. K., Baude, M., Biesmeijer, J., Boatman, N., Budge, G. E., Crowe, A., Memmott, J., Morton, R. D., Pietravalle, S., Potts, S. G., Senapathi, D., Smart, S. M. and Kunin, W. E. (2017) A method for the objective selection of landscape-scale study regions and sites at the national level. *Methods in Ecology & Evolution* [doi:10.1111/2041-210X.12779]

Norton, L.R., Lusardi, J. (2017) Mapping our Natural Capital, IALE UK Spring 2017 Newsletter <http://iale.uk/mapping-our-natural-capital>

Wood, C. M., Smart, S. M., Bunce, R. G. H., Norton, L. R., Maskell, L. C., Howard, D. C., Scott, W. A., and Henrys, P. A. (2017) Long-term vegetation monitoring in Great Britain – the Countryside Survey 1978–2007 and beyond. *Earth Syst. Sci. Data* 9, 445-459, [https://doi.org/10.5194/essd-9-445-2017]

2016

Dupont, A.O.C., Griffiths, R.I., Bell, T., Bass, D. (2016) Differences in soil micro-eukaryotic communities over soil pH gradients are strongly driven by parasites and saprotrophs. *Environmental Microbiology* 18: 2010-2024.

Biggs, J., von Fumetti, S., Kelly-Quinn, M. (2016) The importance of small waterbodies for biodiversity and ecosystem services: implications for policy makers. *Hydrobiologia* 793 (1), 3-39.

Ward, S.E., Smart, S.M., Quirk, H., Tallowin, J.R.B., Mortimer, S.R., Shiel, R.S., Wilby, A., Gardgett, R.D. (2016) Legacy effects of grassland management on soil carbon at depth. *Global Change Biology* 22, 2929-2938. [doi: 10.1111/gcb.13246]

Baude, M, Kunin, WE, Boatman, ND, Conyers, S, Davies, N, Gillespie, MAK, Morton, RD, Smart, SM, Memmott, J. (2016) Historical nectar assessment reveals the fall and rise of floral resources in Britain. *Nature* 530, 85-88. [doi:10.1038/nature16532]

Keith, A.M., Schmidt, O., McMahon, B.J. (2016) Soil stewardship as a nexus between ecosystem services and One Health. *Ecosystem Services* 17, 40-42.

Griffiths, Robert I.; Thomson, Bruce C.; Plassart, Pierre; Gweon, Hyun S.; Stone, Dorothy; Creamer, Rachael E.; Lemanceau, Philippe; Bailey, Mark J.. 2016 Mapping and validating predictions of soil bacterial biodiversity using European and national scale datasets [in special issue: Soil biodiversity and ecosystem functions across Europe: a transect covering variations in bio-geographical zones, land use and soil properties] *Applied Soil Ecology* 97. 61-68. 10.1016/j.apsoil.2015.06.018

Norton, L., Greene, S., Scholefield, P., Dunbar, M. (2016) The importance of scale in the development of ecosystem service indicators? *Ecological Indicators* 61, 130-140. <http://dx.doi.org/10.1016/j.ecolind.2015.08.051>.

Jarvis, SG, Rowe, EC, Henrys, PA, Smart, SM, Jones, L, Garbutt, A. (2016) Empirical realised niche models for British coastal plant species. *Journal of Coastal Conservation* 20, 107-116.

2015

Henrys, P.A., Smart, S.M., Rowe, E.C., Jarvis, S.G., Fang, Z., Evans, C.D., Emmett, B.A., Butler, A. (2015) Niche models for British plants and lichens obtained using an ensemble approach. *New Journal of Botany* 5 (2), 89-100.

Van den Berg, J.L., Jones, L., Sheppard, L.J., Smart, S.M., Bobbink, R., Dise, N.B., Ashmore, M.A. (2015) Evidence for differential effects of reduced and oxidised nitrogen deposition on vegetation independent of nitrogen load. *Environmental Pollution*. [<http://dx.doi.org/10.1016/j.envpol.2015.09.017>]

Stevens, C.J., Payne, R.J., Kimberley, A., Smart, S.M. (2015) How will the semi-natural vegetation of the UK have changed by 2030 given likely changes in nitrogen deposition? *Environmental Pollution* 208, 879-889.

Smart, S.M., Jarvis, S.G., Walker, K.J., Henrys, P.A., Pescott, O.L., Marrs, R.H. (2015) Common plants as indicators of habitats suitability for rare plants; quantifying the strength of the association between threatened plants and their neighbours. *New Journal of Botany* 5 (2), 72-88.

Jarvis, S, Fielder, H, Hopkins, J, Maxted, N, Smart, SM (2015) Distribution of crop wild relatives of conservation priority in the UK landscape *Biological Conservation* 191, 444-451. [<http://dx.doi.org/10.1016/j.biocon.2015.07.039>]

Kimberley, A, Blackburn, G.A., Whyatt, J.D., Smart, S.M. (2015) How well is current forest trait composition predicted by modern and historical forest spatial configuration? *Ecography* 38, 1-10.

Rhodes, C.J., Henrys, P., Siriwardena, G.M., Whittingham, M.J. & Norton, L.R. (2015) The relative value of field survey and remote sensing for biodiversity assessment. *Methods in Ecology and Evolution* 6, 772-781 doi: 10.1111/2041-210X.12385.

Thomas CD & Palmer G (2015) Non-native plants add to the British flora without negative consequences for native diversity. *PNAS* 112 (14), 4387-4392

Hulme et al. 2015. Thomas and Palmer fail to elucidate the genuine threat invasive non-native plants pose to the floristic diversity of Britain. *PNAS*, vol. 112, 23, E2988-E2989

Robinson, D.A. (2015) Moving toward data on soil change. *Science* 347 (6218), 140.

Senapathi, D., Carvalheiro, L.G., Biesmeijer, J.C., Dodson, S., Evans, R.L., McKerchar, M., Morton, R.D., Moss, E.D., Roberts, S.P.M., Kunin, W.E. & Potts, S.G. (2015) The Impact of over 80 years of land cover changes on bee and wasp pollinator communities in England. *Proc. R. Soc. B* 20150294. <http://dx.doi.org/10.1098/rspb.2015.0294>

DeLuca, T.H., Glanville, H.C., Harris, M., Emmett, B.A., Pingree, M.R.A., de Sosa, L.L., Morenà, C., Jones, D.L. (2015) A novel biologically-based approach to evaluating soil phosphorus availability across complex landscapes. *Soil Biology and Biochemistry* 88, 110-119.

Aidan M. Keith, Robert I. Griffiths, Peter A. Henrys, Steve Hughes, Inma Lebron, Lindsay C. Maskell, Stephen M. Ogle, David A. Robinson, Ed C. Rowe, Simon M. Smart, Dave Spurgeon, Claire M. Wood & Bridget E. Emmett. 2015. "Monitoring Soil Natural Capital and Ecosystem Services by Using Large-Scale Survey Data," chapter in *Soil Ecosystem Services*, edited by Mary Stromberger, David Lindbo, and Nick Comerford, SSSA, Madison, WI.

2014

Rowe EC, Smart SM & Emmett BA (2014) Phosphorus availability explains patterns in a productivity indicator in temperate semi-natural vegetation. *Environmental Science: Processes and Impacts*. Themed issue: Macronutrients. [doi: 10.1039/c4em00312h]

Bunce, R.G.H.; Wood, Claire; Smart, Simon; Oakley, R.; Browning, G.; Daniels, M.J.; Ashmole, P.; Cresswell, J.; Holl, K.. 2014 The landscape ecological impact of afforestation on the British Uplands and some initiatives to restore native woodland cover. *Journal of Landscape Ecology* 7 (2), 5-24. [<http://mendelu.vedeckecasopisy.cz/publicFiles/00684.pdf>]

Henrys, P.A., Bee, E.J., Watkins, J.W., Smith, N.A., Griffiths, R.I. (2015) Mapping natural capital: optimising the use of national scale datasets. *Ecography* 38 (6), 632-638.

Kimberley, A, Blackburn, G.A., Whyatt, J.D., Smart, S.M. (2014) Traits of plant communities in fragmented forests: the relative influence of habitat spatial configuration and local abiotic conditions. *Journal of Ecology* 102, 632-640.

2013

Maskell, Lindsay C.; Crowe, Andrew; Dunbar, Michael J.; Emmett, Bridget; Henrys, Peter; Keith, Aidan M.; Norton, Lisa R.; Scholefield, Paul; Clark, Douglas B.; Simpson, Ian C.; Smart, Simon M.. 2013. Exploring the ecological constraints to multiple ecosystem service delivery and biodiversity. *Journal of Applied Ecology* 50(3), 561-571. [doi:[10.1111/1365-2664.12085](https://doi.org/10.1111/1365-2664.12085)]

Kimberley, A., Blackburn, G.A., Whyatt, J.D., Kirkby, K., Smart, S.M. (2013) Identifying the

trait syndromes of conservation indicator species: how distinct are British ancient woodland indicator plants from other woodland species? *Applied Vegetation Science* 16, 667-675.

Critchely, C.N.R., Wilson, L.A., Mole, A.C., Norton, L.R., Smart, S.M. (2013) A functional classification of herbaceous hedgerow vegetation for setting restoration objectives. *Biodiversity and Conservation* 22, 701-717.

Tipping, E., Henrys, P., Maskell, L., Smart, S. (2013) Nitrogen deposition effects on plant species diversity; threshold loads from field data. *Environmental Pollution* 179, 218-223

Reynolds B, Chamberlain PM, Poskitt J, Woods C, Scott WA, Rowe EC, Robinson DA, Frogbrook ZL, Keith AM, Henrys PA, Black HIJ & Emmett BA (2013) Countryside Survey: National 'soil change' 1978-2007 for topsoils in Great Britain, acidity, carbon and total nitrogen status. *Vadose Zone Journal* 12. [doi:10.2136/vzj2012.0114]

Robinson, D.A., Jackson, B.M., Clothier, B.E., Dominati, E.J., Marchant, S.C., Cooper, D.M., Bristow, K.L. (2013) Advances in Soil Ecosystem Services: Concepts, Models and Applications for Earth System Life Support. *Vadose Zone Journal* [doi:10.2136/vzj2013.01.0027]

2012

Maskell, L., Smart, S., Norton, L., Wood, C. (2012): Vegetation Database of Great Britain: Countryside Survey. – In: Dengler, J., Oldeland, J., Jansen, F., Chytrý, M., Ewald, J., Finckh, M., Glöckler, F., Lopez-Gonzalez, G., Peet, R.K., Schaminée, J.H.J. [Eds.]: Vegetation databases for the 21st century. – *Biodiversity & Ecology* 4: 383–383. DOI: 10.7809/b-e.00172.

Scholefield, P.A., Norton, L.R., Rowland, C., Morton, D., Henrys, P. (2012) Developing a model of linear ecological networks for Great Britain in Hedgerow Futures, proceedings of the first International Hedgelink Conference, pp 37-44.

Norton, L.R., Maskell, L.C., Smart, S.S., Dunbar, M.J., Emmett, B.A., Carey, P.D., Williams, P., Crowe, A., Chandler, K., Scott, W.A., Wood, C.M. (2012) Measuring stock and change in the GB countryside for policy – key findings and developments from the Countryside Survey 2007 field survey. *Journal of Environmental Management* 113, 117-127.

Milan Chytrý, Jan Wild, Petr Pyšek, Vojtěch Jarošík, Nicolas Dendoncker, Isabelle Reginster, Joan Pino, Lindsay C. Maskell, Montserrat Vilà, Jan Pergl, Ingolf Kühn, Joachim H. Spangenberg & Josef Settele (2012). Projecting trends in plant invasions in Europe under different scenarios of future land-use change. *Global Ecology and Biogeography* 21(1): 75-87.

Robinson, D.A., Emmett, B.A., Reynolds, B., Rowe, E.C., Spurgeon, D., Keith, A., Lebron, I., Hockley, N. (2013) Soil Natural Capital and Ecosystem Service Delivery in a World of Global Soil Change, *Issues in Environmental Science and Technology* 35, Soils and Food Security, eds R.E Hester and R.M. Harrison. Royal Society of Chemistry, www.rsc.org

Robinson, D.A., Hockley, N., Cooper, D.M., Emmett, B.A., Keith, A.M., Lebron, I., Reynolds, B., Tipping, E., Tye, A.M., Watts, C.W., Whalley, W.R., Black, H.I.J., Warren, G.P.,

Robinson, J.S. (2012) Natural Capital and ecosystem services, developing an appropriate soils framework as a basis for valuation. *Soil Biology and Biochemistry* 57, 1023-1033.

Rowe EC, Emmett BA, Frogbrook ZL, Robinson DA, Hughes S. (2012) Nitrogen deposition and climate effects on soil nitrogen availability: Influences of habitat type and soil characteristics. *Science of the Total Environment* 434, 62-70 [doi:10.1016/j.scitotenv.2011.12.027]

Tipping E, Rowe EC, Evans CD, Mills RTE, Emmett BA, Chaplow JS, et al. (2012) N14C: a plant-soil nitrogen and carbon cycling model to simulate terrestrial ecosystem responses to atmospheric nitrogen deposition. *Ecological Modelling* 247, 11-26.

2011

Griffiths, R. I., Thomson, B. C., James, P., Bell, T., Bailey, M., Whiteley, A. S. (2011) The bacterial biogeography of British soils. *Environmental Microbiology* 13(6): 1642-1654

Gubry-Rangin C, Hai B, Quince C, Engel M, Thomson BC, James P, Griffiths, R. I, et al. (2011) Niche specialization of terrestrial archaeal ammonia oxidizers. *PNAS* 108, 21206-21211.

Norton, L.R., Inwood, H., Crowe, A, Baker, A. (2011) Trialling a method to quantify the 'cultural services' of the English landscape using Countryside Survey data. *Land Use Policy* 29, 449-455.

Simfukwe, P., Hill, P.W.; Emmett, B.A.; Jones, D.L. (2011) Soil classification provides a poor indicator of carbon turnover rates in soil. *Soil Biology & Biochemistry*, 43 (8). 1688-1696.

van den Berg, L.J.L, Vergeer, P, Rich, TCG, Smart, SM, Guest, D, Ashmore, MA. (2011) Direct and indirect effects of nitrogen deposition on species composition change in calcareous grasslands. *Global Change Biology*, 17(5): 1871-1883.

Rowe EC, Emmett BA, Smart SM and Frogbrook ZL (2011) A new net mineralizable nitrogen assay improves predictions of floristic composition. *Journal of Vegetation Science* 22(2): 251-261.

Tipping, E; Wadsworth, RA; Norris, DA; Hall, JR; Ilyin, I (2011) Long-term mercury dynamics in UK soils. *Environmental Pollution*, 159: 3474-3483.

Tipping, E; Poskitt, JM; Lawlor, AJ; Wadsworth, RA; Norris, DA; Hall, JR (2011) Mercury in United Kingdom topsoils; concentrations, pools, and Critical Limit exceedances. *Environmental Pollution* 159, 3721-3729 [doi: 10.1016/j.envpol.2011.07.011]

Rawlins, B.G., Henrys, P., Breward, N., Robinson, D.A., Keith, A.M. & Garcia-Bajo, M. (2011) The importance of inorganic carbon in soil carbon databases and stock estimates: a case study from England. *Soil Use & Management*, 27(3): 312-320. [doi: 10.1111/j.1475-2743.2011.00348.x]

Robinson DA, Hockley N, Dominati E, Lebron I, Scow KM, Reynolds B, et al. (2011) Natural Capital, Ecosystem Services, and Soil Change: Why Soil Science Must Embrace an Ecosystems Approach. *Vadose Zone Journal* 11. [doi:10.2136/vzj2011.0051]

Monson, F. D. (2011) Species of Oribatid mite (Acari: Oribatida) new to Britain. *British Journal of Entomology and Natural History* 24: 57- 68.

Lebron, I., Keith, A. M., Hughes, S., Robinson, D. A., Reynolds, B., Cooper, D., Emmett, B. A. (2011) Evaluation of the occurrence of soils with pH higher than 8.3 observed within the Countryside Survey. Project SP1304. Centre for Ecology & Hydrology, UK.

2010

de Vries, W, Wamelink, W, van Dobben, H, Kros, H, Reinds GJ, Mol-Dijkstra, J, Smart, SM, Evans, CD, Rowe E, Belyazid, S, Sverdrup, H, van Hinsberg, A, Posch, M, Hettelingh, J-P, Spranger, T, Bobbink, R (2010). Use of dynamic soil-vegetation models to assess impacts of nitrogen deposition on plant species composition: an overview. *Ecological Applications* 20(1), 60-79.

Maskell, LC, Smart, SM, Bullock, JM, Thompson, K, Stevens, CJ (2010) Nitrogen Deposition causes widespread loss of species richness in British Habitats. *Global Change Biology* 16, 671-679.

Smart SM, Henrys PA, Scott WA, Hall JR, Evans CD, Crowe A, Rowe EC, Dragosits U, Page T, Whyatt JD, Sowerby A, Clark JM (2010) Impacts of pollution and climate change on ombrotrophic Sphagnum species in the UK: analysis of uncertainties in two empirical niche models. *Climate Research* 45, 163-177

Smart, SM, Scott, WA, Whittaker, J, Hill, MO, Roy, DB, Hinsberg, A, Critchley, CNR, Marini, L, Evans, CD, Emmett, BA, Rowe, EC, Crowe, A, Le Duc, M, Marrs, RH (2010) Empirical realised niche models for British higher and lower plants – development and preliminary testing. *Journal of Vegetation Science* 21(4), 643-656.

2009

Stevens, C.J., Maskell, L.C., Smart, S.M., Caporn, S.J.M., Dise, N.B., Gowing, D.J.G. (2009) Identifying indicators of atmospheric nitrogen deposition impacts in acid grasslands. *Biological Conservation* 142, 2069-2075.

Petit, Sandrine (2009) The dimensions of land use change in rural landscapes: Lessons learnt from the GB Countryside Surveys. *Journal of Environmental Management* 90 (9), 2851-2856.

Ostle, NJ, Levy, PE, Evans, CD, Smith, P (2009) UK land use and soil carbon sequestration. *Land Use Policy*, 26 (Supplement 1).

2008

Chytry, M., Maskell, L.C., Pino, J., Pysek, P., Wild, J., Vila, M. (2008) Mapping the risk of alien plant invasions in Europe, based on the habitat-assessed level of invasion. *Diversity and Distributions* 15, 98-107.

Chytry, M., Maskell, L.C., Pino, J., Pysek, P., Vila, M., Font, X., Smart, S.M. (2008) Habitat invasions by alien plants: a quantitative comparison between Mediterranean, subcontinental and oceanic regions of Europe. *Journal of Applied Ecology* 45, 448–458

Firbank, LG, Petit, S, Smart, SM, Blain, A, Fuller, RJ (2008) Assessing the impacts of agricultural intensification on biodiversity: a British perspective. *Phil. Trans. R. Soc. B* 363, 777-787. 45.

Spurgeon, D.J., Rowland, P. Ainsworth, G. Rothery, P., Long, S. Black, H.I.J. (2008) Geographical and pedological drivers of distribution and risks to soil fauna of seven metals (Cd, Cu, Cr, Ni, Pb, V and Zn) in British soils. *Environmental Pollution* 153, 273-283.

2007

Rowe, EC, Smart, SM, Kennedy, VH, Emmett, BA, Evans, CD (2007) Nitrogen deposition increases the acquisition of phosphorous and potassium by heather *Calluna vulgaris*. *Environmental Pollution* 155, 201-207.

2006

Carvell, C, Roy, DB, Smart, SM, Pywell, RF, Preston, CD, Goulson, D (2006) Declines in forage availability for bumblebees at a national scale. *Biological Conservation* 132, 481-489.

Cooper, A., T. McCann, et al. (2006) The influence of sampling intensity on vegetation classification and the implications for environmental management. *Environmental Conservation* 33(2), 118-127.

Maskell, LC, Firbank, LG, Thompson, K, Bullock, JM, Smart, SM (2006) Interactions between non-native plant species and the floristic composition of common habitats. *Journal of Ecology* 94, 1052-1060.

Petit, S. and L. Firbank (2006) Predicting the risk of losing parcels of semi-natural habitat to intensive agriculture. *Agriculture Ecosystems & Environment* 115(1-4): 277-280.

Smart, SM, Le Duc, M, Marrs, RH, Rossall, MJ, Bunce, RGH, Thompson, K, Firbank, LG (2006) Spatial relationships between intensive land cover and residual plant species diversity in temperate, farmed landscapes. *Journal of Applied Ecology* 43, 1128-1137.

Smart, SM, Le Duc, M, Marrs, RH, Maskell, LC, Thompson, K, Firbank, LG (2006) Biotic homogenization and changes in species diversity across human-modified ecosystems. *Proceedings of the Royal Society. London. B.* 263, 2659-2665.

Heywood, E., Wright, J.F., Weinburg, C.L., Black, H.I.J., Long, S.M., Osborn, D., Spurgeon, D.J. (2006). National distribution of polycyclic aromatic hydrocarbons and polychlorinated biphenyls in British soils. *Environmental Science and Technology* 40, 7629-7635.

2005

Carey, P.D., Manchester, S.J. & Firbank, L.G. (2005) Performance of two agri-environment schemes in England: a comparison of ecological and multi-disciplinary evaluations. *Agriculture, Ecosystems and Environment* 108 178-188.

Firbank, L.G. (2005) Striking the balance between agricultural production and biodiversity. *Annals of Applied Biology* 146 163-175

Smart, S.M., Bunce, R.G.H., Marrs, R., LeDuc, M., Firbank, L.G., Maskell, L.C., Scott, W.A., Thompson, K. & Walker, K. (2005) Large-scale changes in the abundance of common higher plant species across Britain between 1978, 1990 and 1998 as a consequence of human activity: tests of hypothesised changes in trait representation. *Biological Conservation* 124, 355-371.

2004

Weigmann, G and Monson, F. D. (2004) A new genus and species of Haplozetidae (Arachnida: Acari) from Great Britain with a key to the European genera. *Journal of Natural History* 38: 1415-1420.

Comber, A., P. Fisher, et al. (2004) Integrating land-cover data with different ontologies: identifying change from inconsistency. *International Journal of Geographical Information Science* 18(7): 691-708.

Petit, S., Griffiths, L., Smart, S.M., Stuart, R.C, Smith, G. and Wright, S. (2004) Effects of area and isolation of woodland patches on plant species richness across Great Britain. *Landscape Ecology* 19, 463-471

Petit, S., Howard, D.C., Stuart, R.C. (2004) A national perspective on recent changes in the spatial characteristics of woodland in the British landscape. *Landscape and Urban Planning*. 69 127-135

Smart, SM, Ashmore, MR, Hornung, M, Scott, WA, Fowler, DA, Dragosits, U, Howard, DC, Sutton, MA, Famulari, D. (2004) Detecting the signal of atmospheric N deposition in recent national-scale vegetation change across Britain. *Water, Air and Soil Pollution*. 4 269-278.

2003

H.I.J. Black, N.R. Parekh, J.S. Chaplow, F. Monson, J. Watkins, R. Creamer, E.D. Potter, J.M. Poskitt, P. Rowland, G. Ainsworth, M. Hornung (2003) Assessing soil biodiversity across Great Britain: national trends in the occurrence of heterotrophic bacteria and invertebrates in soil. *Journal of Environmental Management* 67 255-266

Carey, P.D., Short, C., Morris, C., Hunt, J., Priscott, A., Davis, M., Finch, C., Curry, N., Little, W., Winter, M., Parkin, A., Firbank L.G. (2003) The multi-disciplinary evaluation of a national agri-environment scheme. *Journal of Environmental Management* 69 71-91

Cooper, A., T. McCann, et al. (2003) Sampling broad habitat change to assess biodiversity conservation action in Northern Ireland. *Journal of Environmental Management* 67(3): 283-290.

Firbank, L.G., Smart, S.M., Crabb, J., Critchley, C.N.R., Fowbert, J.W., Fuller, R.J., Gladders, P., Green, D.B. & Henderson, I. (2003) Agronomic and ecological costs and benefits of set-aside in England. *Agriculture, ecosystems and environment* 95: 73-85.

Firbank, L.G. (2003). Countryside Survey 2000: Special Issue. *Journal of Environmental Management* 67, 205

L.G. Firbank, C.J. Barr, R.G.H. Bunce, M. Furse, R. Haines-Young, M. Hornung, D.C. Howard, J. Sheail, A. Sier & S.M. Smart. (2003). Assessing stock and change in land cover and biodiversity: An introduction to Countryside Survey 2000. *Journal of Environmental Management* 67, 207-218.

Haines-Young, R., Barr, C.J, Firbank, L.G., Furse, M., Howard, D.C., McGowan, G., Petit, S., Smart, S.M. & Watkins, J.W. (2003) Changing landscapes, habitats and vegetation diversity across Great Britain. *Journal of Environmental Management* 67, 267-281.

Heywood E, Wright J, Wienburg CL, Black HIJ, Long SM, Osborn D, et al. Factors influencing the national distribution of polycyclic aromatic hydrocarbons and polychlorinated biphenyls in British soils. *Environmental Science & Technology* 2006; 40: 7629-7635.

D.C. Howard, J.W. Watkins, R.T. Clarke, C.L. Barnett & G.J. Stark. (2003) Estimating the extent and change of Broad Habitats in Great Britain. *Journal of Environmental Management* 67 219-227.

Howard, D. C., S. Petit, et al. (2003) Monitoring multi-functional landscapes at a national scale - guidelines drawn up from the Countryside Survey of Great Britain. *Multifunctional Landscapes, Vol Ii: Monitoring, Diversity and Management* 15: 3-18.

S. Petit, R.C. Stuart, M.K. Gillespie & C.J. Barr. (2003) Field boundaries in Great Britain: stock and change between 1984, 1990 and 1998. *Journal of Environmental Management*, 67, 229-238

Sheail, J. & Bunce, R.G.H. (2003) The development and scientific principles of an environmental classification for strategic ecological survey in the United Kingdom. *Environmental Conservation*, **30**, 147-159.

S.M. Smart, R.C. Clarke, R.G.H. Bunce, H.M. van de Poll, E.J. Robertson, E.R. Shield & L.C. Maskell (2003) National-scale change in the condition of British vegetation; an analysis of sample-based surveillance data from the Countryside Surveys of Great Britain in 1990 and 1998. *Journal of Environmental Management* 67, 239-254

Smart, SM, Joanne Robertson, Eleanor J. Shield, Martine H. van de Poll (2003) Locating eutrophication effects across British vegetation between 1990 and 1998. *Global Change Biology* 9 1763-1774

2002

Bunce, R.G.H., Carey, P.D., Elena-Rossello, R., Orr, J., Watkins, J. & Fuller, R. (2002) A Comparison of different Biogeographical Classifications of Europe, Great Britain and Spain. *Journal of Environmental Management* 65 121-134

Brandt, J., Bunce, R.G.H, Petit, S., Howard, D.C. (2002) Experiences of survey and monitoring in Denmark and Great Britain. *Landscape and Urban Planning* 62 (1): 37-51

Smart, S.M., Bunce, R.G.H., Firbank, L.G., Coward, P. (2002) Do field boundaries act as refugia for grassland plant species diversity in Britain? *Agric.Eco & Env.* 91 73-87.

Bacon, P.J., Cain, J.D. & Howard, D.C. (2002) Belief network models of land cover decisions and land use change: a case study in British uplands. *Journal of Environmental Management* 65 (1): 1-23

Carey, P.D., Barnett, C.L., Greenslade, P.D., Hulmes, S., Garbutt, R.A., Warman, E.A., Myhill, D., Scott, R. J., Smart, S. M., Manchester, S.J., Robinson, J., Walker, K. J., Howard, D.C. & Firbank, L.G. (2002) The ecological quality of land within an agri-environment scheme in England and how it compares with the countryside as a whole ? *Biological Conservation* 108 (2): 183-197

Fuller, R. M., G. M. Smith, et al. (2002). The UK Land Cover Map 2000: Construction of a parcel-based vector map from satellite images. *Cartographic Journal* 39(1): 15-25.

Fuller, R. M., B. K. Wyatt, et al. (1998) Countryside survey from ground and space: different perspectives, complementary results. *Journal of Environmental Management* 54(2): 101-126.

2001

Watkins, J. W., D. C. Howard, et al. (2001) Use of statistical classification techniques in identifying stock and change in broad habitat categories. *Spatial Information and the Environment* 8: 273-281.

2000

Barr C.J., Gillespie M.K. (2000) Estimating hedgerow length and pattern characteristics in Great Britain using Countryside Survey data. *Journal of Environmental Management*, 60, 23-32.

Howard, D. C. and C. J. Barr (2000) Estimating change in landscape elements using different sample sizes. *Quantitative Approaches to Landscape Ecology*: 61-69.

Smart S.M., Firbank L.G., Bunce R.G.H., Watkins J.W. (2000) Quantifying changes in abundance of food plants for butterfly larvae and farmland birds. *Journal of Applied Ecology*, 37, 398-414

Bunce, R.G.H. (2000) The experience of the Countryside Survey in Great Britain for monitoring biodiversity of the wider countryside. In: *European Monitoring for Nature Conservation*, edited by C. Bischoff & R. Droschmeister, 95-104. Bonn: Bundesamt fur Naturschutz.

1999

Haines-Young, R. (1999) Environmental accounts for land cover: their contribution to 'state of the environment' reporting. *Transactions of the Institute of British Geographers* 24(4): 441-456.

1998

Fuller R.M., Wyatt B.K., Barr C.J. (1998) Countryside survey from ground and space: different perspectives, complementary results. *Journal of Environmental Management*, 54, 101-126.

Howard D.C., Barr C.J., Scott W.A. (1998) The validity of using Countryside Survey sample data from Great Britain to estimate land cover in Scotland. *Journal of Environmental Management*, 52, 131-146.

Smith, J.T., Howard, D.C., Wright, S.M., Naylor, C., Brookes, A.M., Hilton, J. & Howard, B.J. (1998) Use of a satellite-derived land cover map to estimate transport of radiocaesium to surface waters. *The Science of the Total Environment*, 209, 1-15.

1997

Stark, G., Barr, C. & Watkins, A.J. (1997) Using the Countryside Information System to inform woodland policy. *Arboricultural Journal*, 21, 127-136.

Milne, R., Brown, T.A. (1997) Carbon in the vegetation and soils of Great Britain. *J.Env. Man.* 49, 413-433.

1996

Bunce, R.G.H., Barr, C.J., Gillespie, M.K. & Howard, D.C. (1996) The ITE Land Classification: providing an environmental stratification of Great Britain. *Environmental Monitoring and Assessment*, 39, 39-46. Also published in: Global to local: ecological land classification, edited by R.A.Sims, I.G.W.Corns & K.Klinka. Dordrecht: Kluwer.

Bunce, R.G.H., Barr, C.J., Clarke, R.T., Howard, D.C. & Lane, A.M.J. (1996) ITE Merlewood Land Classification of Great Britain. *Journal of Biogeography*, 23, 625-634.

Bunce, R.G.H., Barr, C.J., Clarke, R.T., Howard, D.C. & Lane, A.M.J. 1996. Land classification for strategic ecological survey. *Journal of Environmental Management*, 47, 37-60.

Gillespie, M.K., Howard, D.C., Ness, M.J. & Fuller, R.M. 1996. Linking satellite and field survey data, through the use of GIS, as implemented in Great Britain in the Countryside Survey 1990 project. *Environmental Monitoring and Assessment*, 39, 385-398. Also published in: Global to local: ecological land classification, edited by R.A.Sims, I.G.W.Corns & K.Klinka. Dordrecht: Kluwer.

Howard, D.C. & Bunce, R.G.H. (1996) The Countryside Information System: a strategic-level decision support system. *Environmental Monitoring and Assessment*, 39, 373-384. Also published in: Global to local: ecological land classification, edited by R.A.Sims, I.G.W.Corns & K.Klinka. Dordrecht: Kluwer.

Howard, D.C., Fuller, R.M. & Barr, C.J. (1996) Linking ecological information recorded from ground, air and space: examples from Countryside Survey 1990. *Global Ecology and Biogeography Letters*, 5, 227-234.

Pakeman, R.J., Marrs, R.H., Howard, D.C., Barr, C.J. & Fuller, R.M. (1996) The bracken problem in Great Britain: its present extent and future changes. *Applied Geography*, 16, 65-86.

Potter, C., Barr, C. & Lobley, M. (1996) Environmental change in Britain's countryside: an analysis of recent patterns and socio-economic processes based on the Countryside Survey 1990. *Journal of Environmental Management*, 48, 169-186.

Potter, C. and M. Lobley (1996) The farm family life cycle, succession paths and environmental change in Britain's countryside. *Journal of Agricultural Economics* 47(2): 172-190.

1995

Bardgett, R.D., Marsden, J.H. & Howard, D.C. (1995) The extent and condition of heather on moorland in the uplands of England and Wales. *Biological Conservation*, 71, 155-161.

Cherrill, A.J., Lane, A. (1995). The survey and prediction of land cover using an environmental land classification. *Applied Geography*, 15, 69-85.

Cherrill, A.J., McClean, C., Lane, A. & Fuller, R.M. 1995. A comparison of land cover types in an ecological field survey in northern England and a remotely sensed Land Cover Map of Great Britain. *Biological Conservation*, 71, 313-323.

Howard, D.M., Howard, P.J.A. & Howard, D.C. (1995). A Markov model projection of soil organic carbon stores following land use changes. *Journal of Environmental Management*, 45, 287-302.

Howard, P.J.A., Loveland, P.J., Bradley, R.I., Dry, F.T., Howard, D.M. & Howard, D.C. (1995). The carbon content of soil and its geographical distribution in Great Britain. *Soil Use and Management*, 11, 9-15.

1994

Barr, C. (1994) Countryside Survey 1990 - an overview. *Ecos*, 15(3/4): p.9-18.

Barr, C.J., R.G.H. Bunce, and O.W. Heal, Countryside Survey (1990): a measure of change. *Journal of the Royal Agricultural Society of England*, 1994. 155: p.48-58.